David A. Smith

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Professional Objectives

To apply scientific principles and technical problem solving skills to the development of beneficial products. To contribute to a team convinced of the importance of their work. To, eventually, provide leadership to capable individuals willing to work together to achieve concrete goals.

Education

Ph.D., Electrical Engineering, 1998.
University of Colorado at Boulder.
Dissertation: "Compact Intracloud Discharges."
GPA: 3.93 / 4.00.

M.S., Electrical Engineering, 1995.
University of Colorado at Boulder.
Thesis: "A Multiple-Channel Sub-Band Transient Detection System."
GPA: 3.82 / 4.00.

B.S., Electrical Engineering, 1993.
University of Colorado at Boulder (1991 to 1993).
GPA: 3.71 / 4.00.
University of New Mexico at Los Alamos (1990-1991).
University of California at Berkeley (1988 to 1990).

Professional Experience

Postdoctoral Research Associate (11/98 to present).
Space and Atmospheric Science Group, Los Alamos National Laboratory (LANL), Los Alamos, New Mexico.

Lead a team of researchers who have implemented and now operate two arrays of electric field change meters. The arrays, located in New Mexico and Florida, have been utilized since May of 1998 to detect, locate, and characterize sources of transient radio emissions.

Process and analyze data from the array to learn more about lightning and methods of detecting and locating EMP from nuclear detonations. Have developed and implemented methods to automatically classify events and to locate their sources.

Work closely with other members of the FORTE satellite science team to broaden our understanding of lightning and other areas of interest that are related to EMP detection (e.g. radiowave propagation through the ionosphere and problems associated with anthropogenic noise sources)

Coordinate activities involving the Los Alamos Portable Pulser, including transmissions to GPS satellites, FORTE, ALEXIS, and other assets)

Have developed and refined my writing and speaking skills by making presentations at national conferences and by publishing papers in internationally-recognized journals and proceedings.

Have maintained an active DOE Q-Clearance since 1990.

Graduate Research Assistant (01/94 to 11/98).
Space and Atmospheric Science Group, Los Alamos National Laboratory, Los Alamos, New Mexico.
Led the design and implementation of a 3-station array of broadband HF receivers to characterize and locate sources of radio emissions originating both locally and over-the-horizon. Used data from the array in conjunction with data from an array of electric field change meters to identify and characterize a new class of thunderstorm electrical discharges that produces powerful, short-duration radio emissions.
Worked closely with the NIS FORTÉ Science Team to analyze and interpret data from the FORTÉ and Blackbeard satellite instruments and the LANL electric field change meter array.
Led the design and implementation of a multiple-channel, sub-band receiver system that detects and records electromagnetic impulses in carrier-dominated radio environments. Used data from the system to make unique observations of lightning and other sources of transient radio emissions.
Worked as a consultant to other LANL groups in the areas of ground penetrating radar and electromagnetic interference.

Undergraduate Research Assistant (05/89 to 12/93).
Space and Atmospheric Science Group, Los Alamos National Laboratory, Los Alamos, New Mexico.
Worked in a small group responsible for the design and implementation of the Los Alamos Portable Pulser, a transmitter used to calibrate Global Positioning Satellites.
Performed extensive work in the design, construction, and testing of radio frequency antennas.
Gained valuable experience in data acquisition, processing, analysis, and presentation.

Performance Awards, Certificates, and Scholarships
Graduate Certificate in Remote Sensing, University of Colorado, 1998.
Distinguished Performance Award, Los Alamos National Laboratory, 1998.
Student Achievement Scholarship, Nonproliferation and International Security Division, Los Alamos National Laboratory, 1997-1998.
Personal Achievement Award, Los Alamos National Laboratory, 1996.
Undergraduate Certificate of Environmental Achievement, University of Colorado, 1993.
Platt Wicks Memorial Scholarship, University of Colorado, 1992-1993.
Distinguished Performance Award Nomination, Los Alamos National Laboratory, 1990.
Honorary Scholarship, University of California, 1988-1989.

Presentations
"Ground-based investigations of compact intracloud discharges," Seminar for the Space and Atmospheric Science Group, Los Alamos National Laboratory, Feb. 9, 1999.
"Theory and practice of using ground and ionospheric reflections to determine radio emission source heights and ionosphere virtual heights," Presentation at the National Radio Science Meeting, Boulder, Jan. 4, 1999.
"Observations of compact intracloud discharges (CIDs)," Presentation at the American Geophysical Union Fall Meeting, San Francisco, Dec. 9, 1998.
"Physical characteristics of compact intracloud discharges (CIDs)," Poster presentation at the American Geophysical Union Fall Meeting, San Francisco, Dec. 8, 1998.
"Characterization of unique thunderstorm electrical discharges," Presentation at the American Geophysical Union Fall Meeting, San Francisco, Dec. 9, 1997.
"Calibration and evaluation of Blackbeard time tagging capability," Presentation at the 11th AIAA / USU Conference on Small Satellites, Utah State University, Sep. 16, 1997.
"Further investigation into the thunderstorm process which produces TIPP events," Seminar for the Space and Atmospheric Science Group, Los Alamos National Laboratory, Jul. 8, 1997.

"Observations of isolated high frequency radio bursts in association with thunderstorm activity: a possible link to TIPP events," Poster presentation at the American Geophysical Union Fall Meeting, San Francisco, Dec. 17, 1996.

"TIPPS: ground-based observations of likely sources," Joint seminar with Xuan-Min Shao for the Space and Atmospheric Science Group, Los Alamos National Laboratory, Sep. 17, 1996.

"Ground-based observations of subionospheric pulse pairs," Seminar for the Department of Electrical Engineering, University of Colorado at Boulder, Feb. 3, 1995.

"Initial Blackbeard power survey results," Poster presentation at the American Geophysical Union Fall Meeting, San Francisco, Dec. 7, 1994.

"Ground-based observations of subionospheric pulse pairs," Presentation at the American Geophysical Union Fall Meeting, San Francisco, Dec. 6, 1994.

"Detection of radio frequency subionospheric pulse pairs," Seminar for the Space and Atmospheric Science Group, Los Alamos National Laboratory, Sep. 2, 1994.

Publications

"Observations and analysis of distinct thunderstorm radio emissions," D. A. Smith, X. M. Shao, D. N. Holden, C. T. Rhodes, P. R. Krehbiel, M. Stanley, M. Brook, R. Thomas, *J. Geophys. Res.*, **104**, 4189-4212, 1999.

"Calibration and evaluation of Blackbeard time tagging capability," (unrefereed) D. A. Smith, D. M. DeLapp, D. N. Holden, P. L. Klingner, G. L. Stelzer, *The 11th Annual AIAA/Utah State University Conference on Small Satellites*, Sep. 1997.

"Ground-based observations of subionospheric pulse pairs," D. A. Smith and D. N. Holden, *Radio Science*, **31**, 553-571, 1996.

Abstracts (no paper)

"Theory and practice of using ground and ionospheric reflections to determine radio emission source heights and ionosphere virtual heights," D. A. Smith, R. S. Massey, X. M. Shao, K. C. Wiens, National Radio Science Meeting Program and Abstracts, pp. 94, International Union of Radio Science, 1999.

"Physical characteristics of compact intracloud discharges (CIDs)," D. A. Smith, D. N. Holden, X. M. Shao, P. R. Krehbiel, *Eos, Trans., Amer. Geophys. Union*, **79**, 45, 1998.

"Observations of compact intracloud discharges (CIDs)," X. M. Shao, D. A. Smith, K. B. Eack, R. S. Massey, K. C. Wiens, *Eos, Trans., Amer. Geophys. Union*, **79**, 45, 1998.

"Characterization of unique thunderstorm electrical discharges," D. A. Smith, X. M. Shao, D. N. Holden, C. T. Rhodes, *Eos, Trans., Amer. Geophys. Union*, **78**, 46, 1997.

"Observations of large-amplitude bipolar electric field change pulses: possible sources for TIPP events," X. M. Shao, D. A. Smith, C. T. Rhodes, D. N. Holden, R. S. Massey, J. Lopez, M. Brook, P. R. Krehbiel, M. Stanley, R. Thomas, *Eos, Trans., Amer. Geophys. Union*, **77**, 46, 1996.

"Observations of isolated high frequency radio bursts in association with thunderstorm activity: a possible link to TIPP events," D. A. Smith, X. M. Shao, D. N. Holden, R. S. Massey, C. T. Rhodes, B. J. Wiemers, *Eos, Trans., Amer. Geophys. Union*, **77**, 46, 1996.

"Ground-based investigations into the sources of TIPP events," D. N. Holden, D. A. Smith, X. M. Shao, R. S. Massey, C. T. Rhodes, J. R. Lopez, *Eos, Trans., Amer. Geophys. Union*, **77**, 46, 1996.

"Current status of TIPP observations," J. C. Devenport, D. N. Holden, R. S. Massey, D. A. Smith, *Eos, Trans., Amer. Geophys. Union*, **76**, 46, 1995.

"Ground-based observations of subionospheric pulse pairs," D. A. Smith and D. N. Holden, *Eos, Trans., Amer. Geophys. Union*, **75**, 55, 1994.

Memberships, Affiliations, and Certifications

Member of the American Geophysical Union (AGU).
Member of the American Institute of Aeronautics and Astronautics (AIAA).
Member of the Institute of Electrical and Electronics Engineers (IEEE).
Member of Eta Kappa Nu, the National Electrical Engineering Honor Society.
Member of Tau Beta Pi, the National Engineering Honor Society.
Member of Golden Key National Honor Society.
Member of the Pajarito Astronomers.
Member of the Aircraft Owners and Pilots Association (AOPA).
Member of the Experimental Aircraft Association (EAA).
Member of the International Aerobatic Club (IAC).
FAA certificated Private Pilot.
FCC certified Amateur Radio Operator.
LANL certified to erect and climb antenna towers.
LANL certified to operate extensible aerial lift/platform vehicles.

References

Available Upon Request.